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2.1 Configuration Management (CM) Process

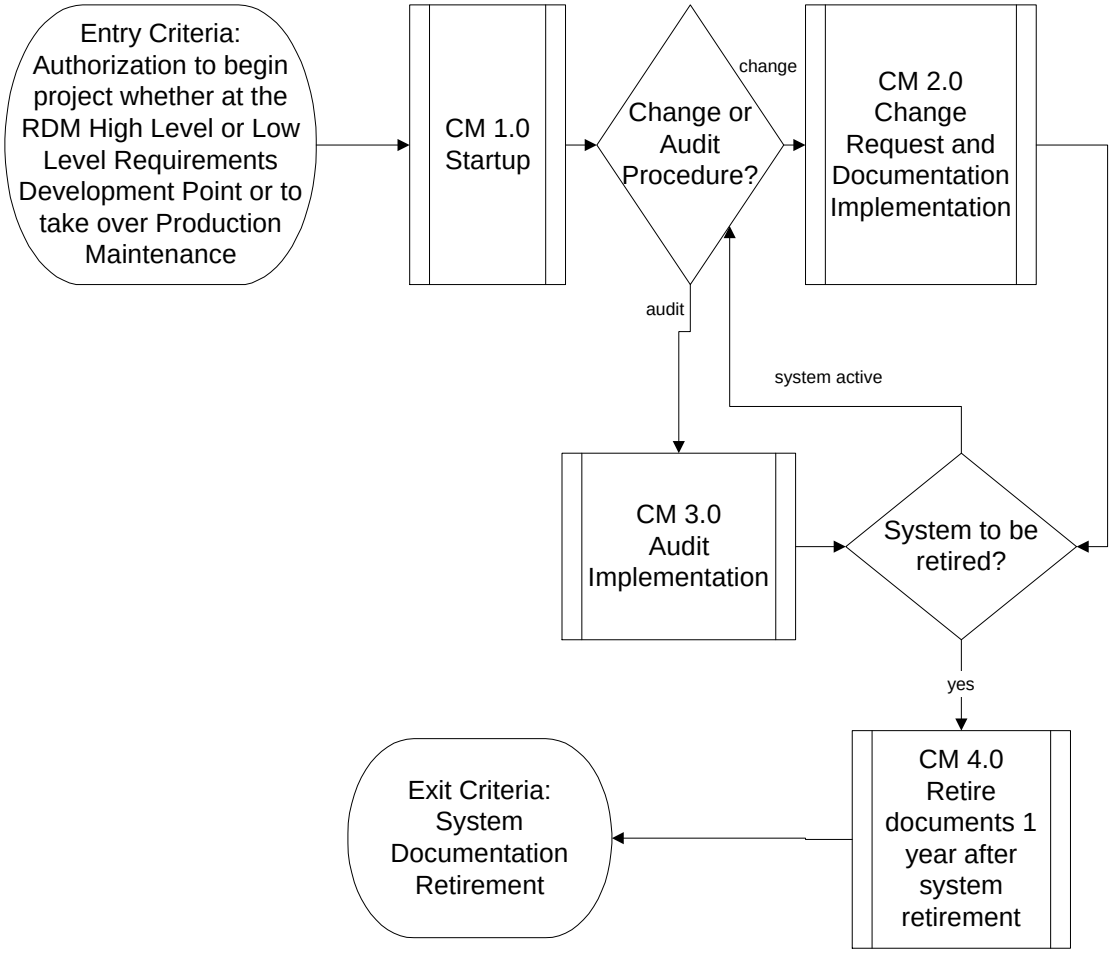
Purpose

The CM Process is designed to provide a systematic method to follow to produce high quality control of documentation needed for projects of any nature (whether developing software, maintaining production systems, or doing analysis of a non-software developing nature).

Benefits

- Minimizes error due to the inadvertent use of the wrong version of a document/code
- Minimizes one individual inadvertently over-writing another individual's changes
- Minimizes conflict dealing with agreed requirements, testability, and changes
- Reduces rework costs that are significantly higher if undertaken later on in a project's life cycle
- Standardizes CM documentation, decision-making procedures, and escalation procedures
- Supports any third-party vendor wishing to follow Systems Engineering Institute's (SEI) Capability Maturity Model(s) {CMM(I)} guidelines
- Supports Mod Partner and its internal policy 1162
- Is a component of the SFA Solutions Life Cycle (SLC)
- Supports SFA Quality Assurance (QA) audits
- Supports the Production Readiness Review (PRR) process
- May be a specific requirement for some contracts
- Supports the Clinger-Cohen Act

Enterprise Configuration Management (ECMI)
Configuration Management Process



IMPORTANT NOTE: The Configuration Management (CM) and Requirements Development and Management (RDM) processes are closely interwoven. CM handles the procedures involving the management and documentation of decisions while RDM frequently is the substance that requires decisions. RDM procedures handle the initiation and impact analyses of desired changes while CM procedures handle the disposition and documentation of the desired changes. Neither CM nor RDM is specific to code development and storage. CM and RDM are integral to any task that requires maintenance and future change. While the CM Lead and the RDM Lead are often different individuals, the two should be part of the initial ramping up staff for the vision phase.

Entry Criteria- Authorization to begin project whether at the RDM High Level or Low Level Requirements Development point or to take over Production Maintenance

All work tasks that are likely to require future adjustments need Configuration Management (CM) at the earliest point possible because it is the planning and change control mechanism for the task. The term “all work tasks” includes:

- Software development as well as task development, which has no software.
- System production, maintenance and standards as well as system development.
- SFA sponsored work regardless of the working individual being a federal employee, a prime contractor, or a subcontractor

Recommended additional reading:

- Sections 1 and 2 of this document
- SLC Process Guide
- SEI CMM(I) publications

CM1.0 – Startup Procedure

CM1.0 (Startup Procedure) is the initiation point for any project or task in which the responsible authority is either starting a new work assignment or taking over an existing work assignment from another organization. The four most common points are:

- The initial process of deriving authority and funding for a task
- The vision phase of a project in which the funded requirement is to develop a set of high level requirements for a future work assignment
- The initiation of the process of analyzing high level requirements in order to develop a set of testable low level requirements
- The Transition to Support (TTS) process in which a new organization assumes responsibility for maintaining a production system

The CM1.0 (Startup Procedure) consists of identifying key individuals, training them, creating an initial plan, and creating both a change organization and an initial repository space

Recommended additional reading:

- Sections 2.1.1 CM Startup Procedure and 2.1.2 CM Documentation Startup Baseline Sub-Procedure in this document
- Vision and Definition Phases documentation in this document
- Vision and Definition Phases documentation in the SLC Process Guide

CM2.0 – Change Request and Documentation Implementation

CM2.0 (Change Request and Documentation Implementation Procedure) is the ongoing procedure of identifying, processing, deciding, and documenting changes to a task or project.

Recommended additional reading:

- Section 2.1.3 CM Change Request Documentation Procedure in this document
- Section 2.1.4 CM Change Request Baselining Sub-Procedure in this document
- Section 2.1.5 CM Escalation Sub-Procedure in this document
- Construction, Deployment, and Support Phases documentation in this document
- Construction, Deployment, and Support Phases documentation in the SLC Process Guide

CM3.0 – Audit Implementation

CM3.0 (Audit Implementation) is both the ongoing internal verification that CM is being handled properly by the task or project personnel as well as external verifications that range from mentoring and assistance to GAO investigations

Recommended additional reading:

- Section 2.1.6 CM Audit Procedure in this document
- Quality Assurance (QA) references in the SLC Process Guide
- Quality Assurance (QA) Handbook
- Accenture Individuals only: Accenture Policy 1162
- Fiscal Year (FY02) only: the Enterprise Configuration Management Implementation (ECMI) and Solution Life Cycle (SLC) Deployment Mod Partner task order groups
- SFA regulations dealing with external audits

CM4.0 – Retire documents 1 year after system retirement

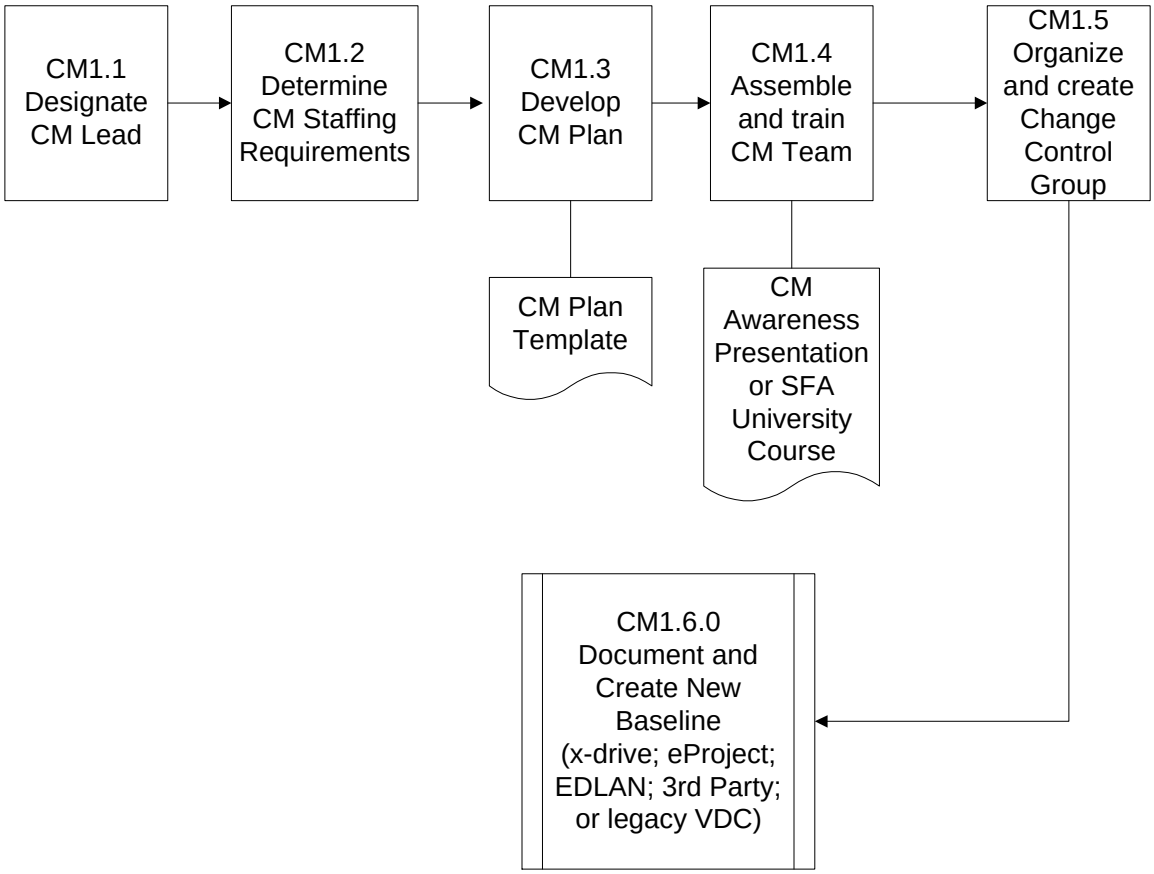
CM4.0 (Retire documents 1 year after system retirement) handles the destruction process for records that are no longer needed. The National Archiving Records Act (NARA) General Records Schedules 3, 20, and 24 require that certain types of Information Technology (IT) records be kept for differing periods of time and then be destroyed. For CM, GRS24 requires the complete decision-making history from financing to system shutdown. Security inspection data must also be maintained.

Recommended additional reading:

- Section 2.1.7 CM Retirement Procedure in this document
- NARA GRS24 regulations

Exit Criteria – System documentation retirement occurs one year after the system is replaced or shut down

2.1.1 CM Startup Procedure (CM1.0)



CM1.1 – Designate CM Lead

CM1.1 (Designate CM Lead) is a step that should occur at the very beginning of the task or project. The CM Lead will formalize and document the decisions of the project. The CM Lead also helps minimize errors such as no version control resulting in no way back or two individuals overwriting each other while doing development or maintenance. The CM Lead also helps provide needed documentation to individuals as well as to minimize someone responding to an outdated document. The FTE for the CM Lead will depend on the project (and there are estimates from both an appendix in this document and from Accenture's QPI team). In general, for average size projects the workload will vary over time but the staffing implication is for a part-time assignment combinable into aspects such as PRR preparation and testing.

Recommended additional reading:

- Vision phase of the SLC in section 1.1 of this document
- Section 3.1.1 "Assign Configuration Management Roles" of this document
- Manpower estimating appendix in this document
- SLC Process Guide
- SEI CMM documentation

CM1.2 – Determine CM Staffing Requirements

CM1.2 (Determine CM Staffing Requirements) Many of the software development projects have multiple sites. Each site needs a CM staff. A project needs at least one Change Control Group. Some projects are sufficiently complex that there may be separate Change Control Sub-Groups dedicated to one aspect of the project. It may be convenient to have separate Change Control Sub-Groups divided along contract boundaries. The functioning of sub-groups to groups is similar to the functioning of project to enterprise wide change control groups. Issues that are likely to affect other groups or are beyond the purview of the immediate group should be escalated to the next higher body and await a decision. There are also different skill sets implied in a CM staff. Someone needs to function as a librarian/ report maker. Someone needs to function as a minutes taker. Someone needs to schedule meetings and track outstanding issues to closure. For those individuals controlling code versions there needs to be a specialist available to work with the control software. Someone needs to teach and or audit CM.

Recommended additional reading:

- Section 3.1.2 of this document

CM1.3 – Develop CM Plan

There is a CM Plan template in this document and an Accenture QPI template that is available to Accenture. The Accenture QPI model is more complex but remains consistent with the CM Process Guide CM Plan template. Essentially the Project CM Plan must cover all aspects of organizing, planning, conducting, reporting, and measuring change control, document storage, and CM auditing/ training. Major terms used include Configuration Identification and Configuration Index (table of contents for what is controlled), Configuration Control (decision process and version control), Configuration Status Accounting (change status and reporting of controlled items), and Configuration Auditing (being prepared for project-external audits as well as insuring that the internal elements of the project conform to CM requirements).

Recommended additional reading:

- CM Plan template in this document
- Accenture QPI CM Plan template

CM1.4 – Assemble and train CM Team

There is very little in-house prepared training material. There are some SFA courses under development (FY02). The CM Lead must take the lead in providing insight and documentation for training. For individuals charged with using or managing a change management software, commercial training for that software may be an advisable plan of action. SFA advocates the use of the Rational software suite for code management. Additionally, some Change Control documentation systems (e.g. VDC Development) are being developed in ClearCase. An initial storage point for controlled documents is likely to be eProject because it stores virtually any type of document in a directory/folder system and is readily available to SFA, Mod Partner, and other third party vendors. The eventual resting place for long-term storage of the decision process documentation will be an SFA repository, which is likely to consist of a folder structure, and the ability to house different document formats.

Recommended additional reading:

- SFA Policy documents relating to change control and storage media
- Commercial documentation relating to chosen storage media

CM1.5 – Establish Change Control Group

The change control group (CCG) **IS** the change decision-making body for decision authority within the project. As a minimum the CCG should include the project leader/manager. In essense there are two CM bodies: the decision making group (the CCG) and the support group (e.g. minutes, auditing, and documentation). The RDM Lead and subject matter experts who are qualified to discuss the merits of a change request should also be in attendance. The operation of a CCG is discussed as procedure CM2.0.

Recommended additional reading:

- Section 3.1.2 (Establish a Change Control Group) in this document

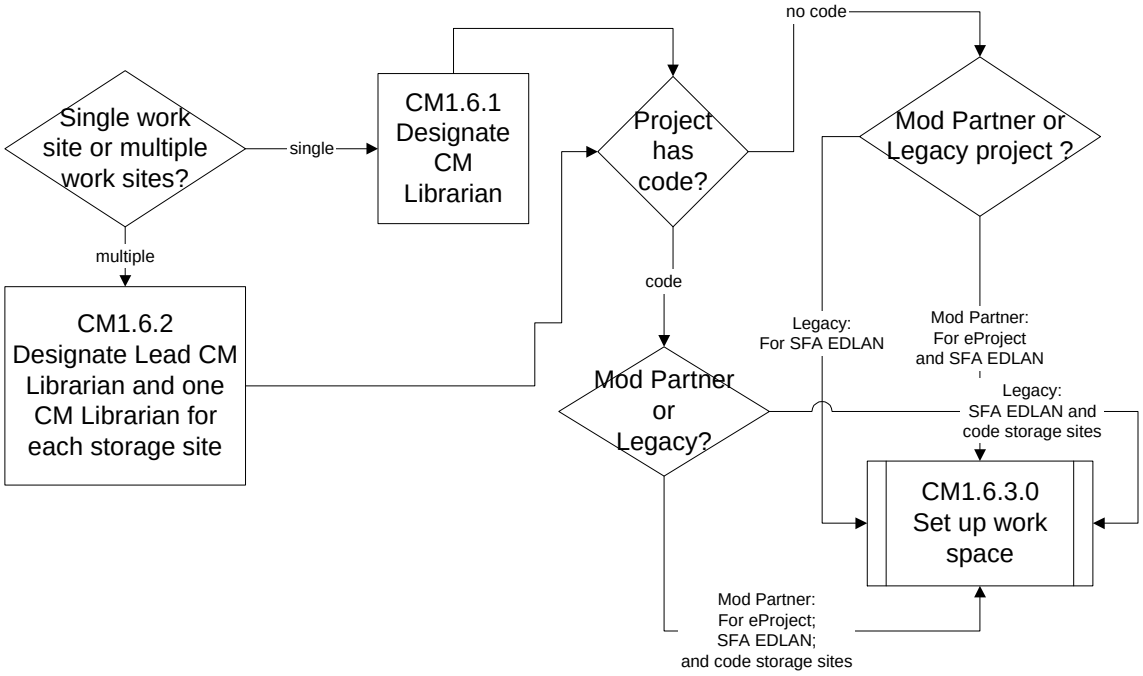
CM 1.6 – Document and Create a New Baseline

CM1.6 (Document and Create a New Baseline) deals with designating librarians and setting up workspace. CM1.6 concerns itself with getting started. CM2.5 concerns itself with operating an existing storage medium.

Recommended additional reading:

- Section 2.1.2 CM Documentation Startup Baseline Sub-Procedure

2.1.2 CM Documentation Startup Baseline Sub-Procedure (CM1.6.0)



CM1.6.1 – Designate CM Librarian

A single site may well need to have only one CM Librarian who is responsible for the controlled document storage. There may be a need for two types of CM Librarians if code is stored via one system and non-code is stored via a different system.

CM1.6.2 – Designate Lead CM Librarian and one CM Librarian for each storage site

In those cases (frequently the normal case) in which a project is developing over two or more sites, then a lead CM Librarian and a CM Librarian for each site are necessary. There may be a need for more than one CM Librarian at one site if code and non-code are stored in different media.

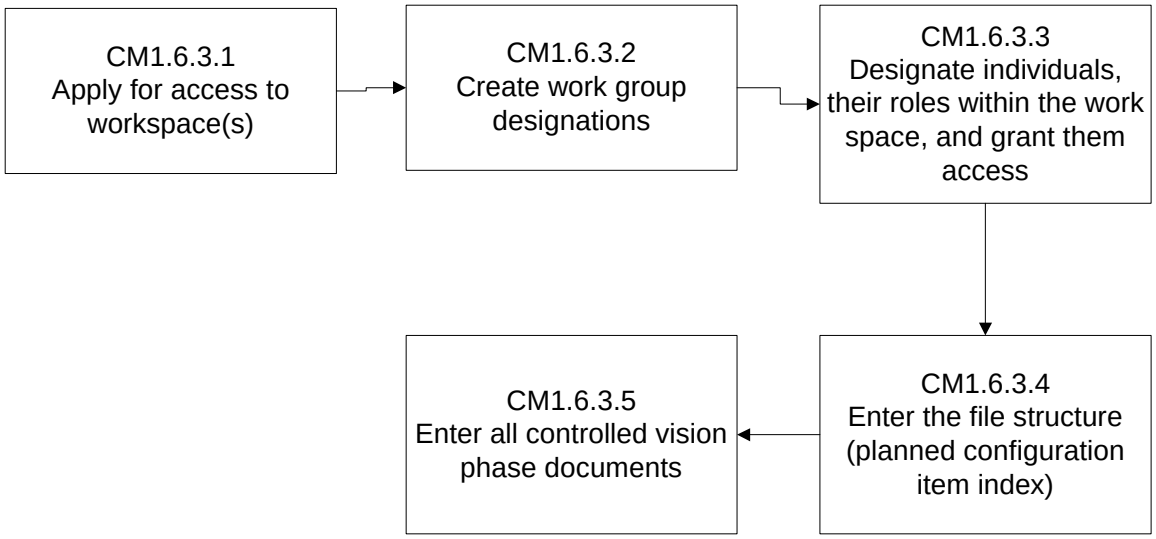
CM1.6.3 – Set up workspace

Electronic storage must be applied for, permissions must be granted, and structures must be established.

Recommended additional reading:

- Section 2.1.3 CM Set up Workspace Sub-Sub-Procedure (CM1.6.3.0)

2.1.3 CM Set up Workspace Sub-Sub-Procedure (CM1.6.3.0)



CM1.6.3.1 – Apply for access to workspace(s)

ModPartner projects normally have a workspace in eProject assigned based on having a task order. The CM Lead or Librarian needs to apply to the PMO for System Administrator rights to that workspace.

SFA documentation can go to a number of places at this time. Application for workspace authority needs to be researched for each case.

While ModPartner projects may choose to initiate documentation storage in eProject (generally for ease of access for all individuals by avoiding corporate boundary access limitations), eventually that documentation must be migrated to an SFA workspace.

Code management software will be housed differently than in eProject. This approach will require research and application. Documentation to support this approach is under development.

Vendors at other sites may have their own rules about workspace accessibility. Workspace sharing and configuration will depend on contractual terms.

CM1.6.3.2 – Create work group designations

Stored documentation will vary from a limited reading audience (e.g. financial documents) to a more widespread audience (e.g. low-level requirements for development and testing). The CM Librarian needs to identify how many different groups should exist and create workgroup designations

CM1.6.3.3 – Designate individuals, their roles within the workspace, and grant them access

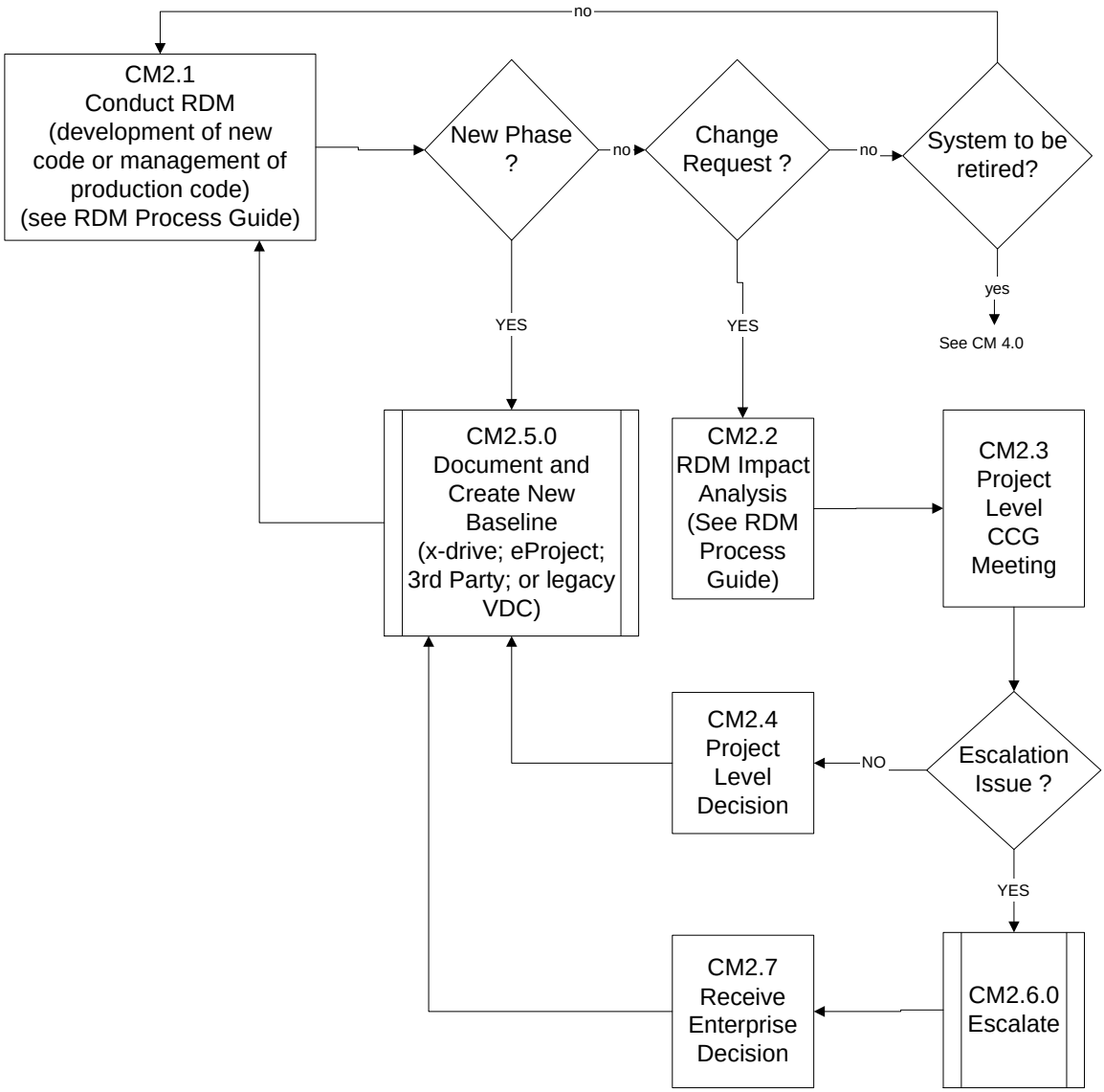
Some individuals (roles) (e.g. Project Manager) need to have access to all documents while other individuals (roles) need more limited access. There should be a control on the number of individuals who can grant these access rights (enough not to choke the process but not so many that control is lost)

CM1.6.3.4 – Enter the file structure (planned configuration item index)

Many softwares allow the creation of a file structure without there being any contents (e.g. eProject and Microsoft desktop). These softwares allow for the initial set of perceived documentary requirements and allow for an "empty" file structure for future configuration item indexes. In essence the empty file structure becomes the library filing structure for new documents as they arrive.

Some softwares identify documents only when they exist (e.g. Rational ClearCase). Under this condition the CM Librarian should ascertain a naming convention or generational relationship model, which will allow a current Configuration Item Index to be created and managed.

2.1.4 Change Request Documentation Procedure (CM2.0)



CM2.1 – Conduct RDM (development of new code or management of production code)

CM2.1 **is** the normal process for initiating change and is documented as RDM rather than as CM. RDM handles the processes of identifying and analyzing the impact of changes while CM handles the processes of getting and documenting a decision for that change request.

Recommended additional reading:

- RDM Process Guide

CM2.2 – RDM Impact Analysis

Every change request that is not perceived as frivolous requires an impact analysis (the depth of analysis will vary). As in CM2.1, this is an RDM function rather than a CM function.

Recommended additional reading:

- RDM Process Guide

CM2.3 – Project Level CCG Meeting

CM2.3 implies establishing a normal time interval for "everyday" changes and all of the normal activities associated with a meeting (scheduling, agenda, minutes, action tracking, stored documentation). Developers and/or production managers also need to identify emergency situations that will trigger an emergency decision followed by the normal documentation associated with a "normal" change request.

CM2.4 – Project Level Decision

Frequently both development and production systems managers have some latitude for decision-making (even if it is to do additional work without additional payment). CM2.3 covers the scheduling and conduct of CCG meetings. CM2.4 handles change requests that are denied or that are within the purview of the project to decide (issues likely to affect other projects should be elevated).

CM2.5 – Document and Create a New Baseline

All CCG decisions, even those that are denials, should be documented and stored in the baseline (and thereby require an updating of the Configuration Item Index).

Recommended additional reading:

- Section 2.1.5 Document and Create New Baseline

CM2.6 – Escalate

Any decision not within the purview of the project manager (or any decision likely to affect other projects) must be elevated to the appropriate enterprise level configuration control group. At the present time this is a highly fragmented procedure so CM2.6.0 should be studied for applicability. Open issues must be tracked.

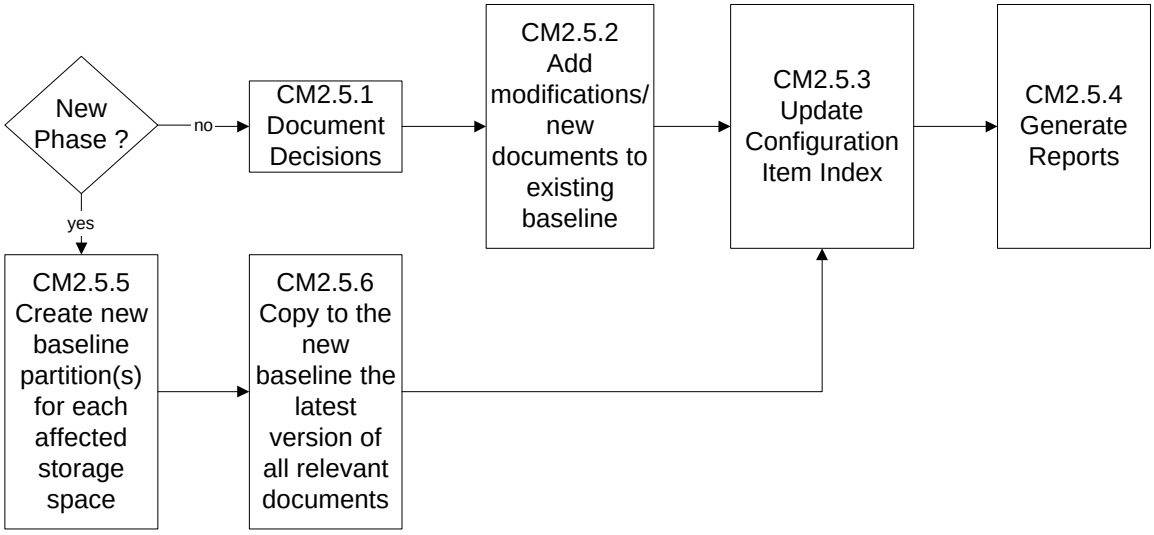
Recommended additional reading:

- Section 2.1.6 Escalate

CM2.7- Receive Enterprise Decision

In CM2.3 there is a project level CCG meeting. In CM2.6 a particular issue is escalated to a higher CCG (which one depending on a number of factors discussed within CM2.6.0). The tracking of open issues should occur in CM2.6. In CM2.7 an enterprise level CCG decision is given to the project.

2.1.5 Change Request Baselining Sub-Procedure (CM2.5.0)



CM2.5.1 – Document Decisions

CM2.5.1 handles approvals and rejections by the projects and enterprise level decisions. The decision implies an update to some document.

CM2.5.2 – Add modifications/new documents to existing baseline

Adding the implied update from CM2.5.1 will require the physical transfer of a document.

CM2.5.3 – Update Configuration Item Index

Any document added to the baseline will require an updating of the Configuration Item Index

CM2.5.4 – Generate Reports

Management will be interested in knowing issues that are still unresolved and what role is handling that action. Others will be interested in the current list of requirements. CM2.5.4 implies the creation or existence of a number of standard and a few special reports. CM2.5.4 also implies that there will be periodic reports generated for selected individuals.

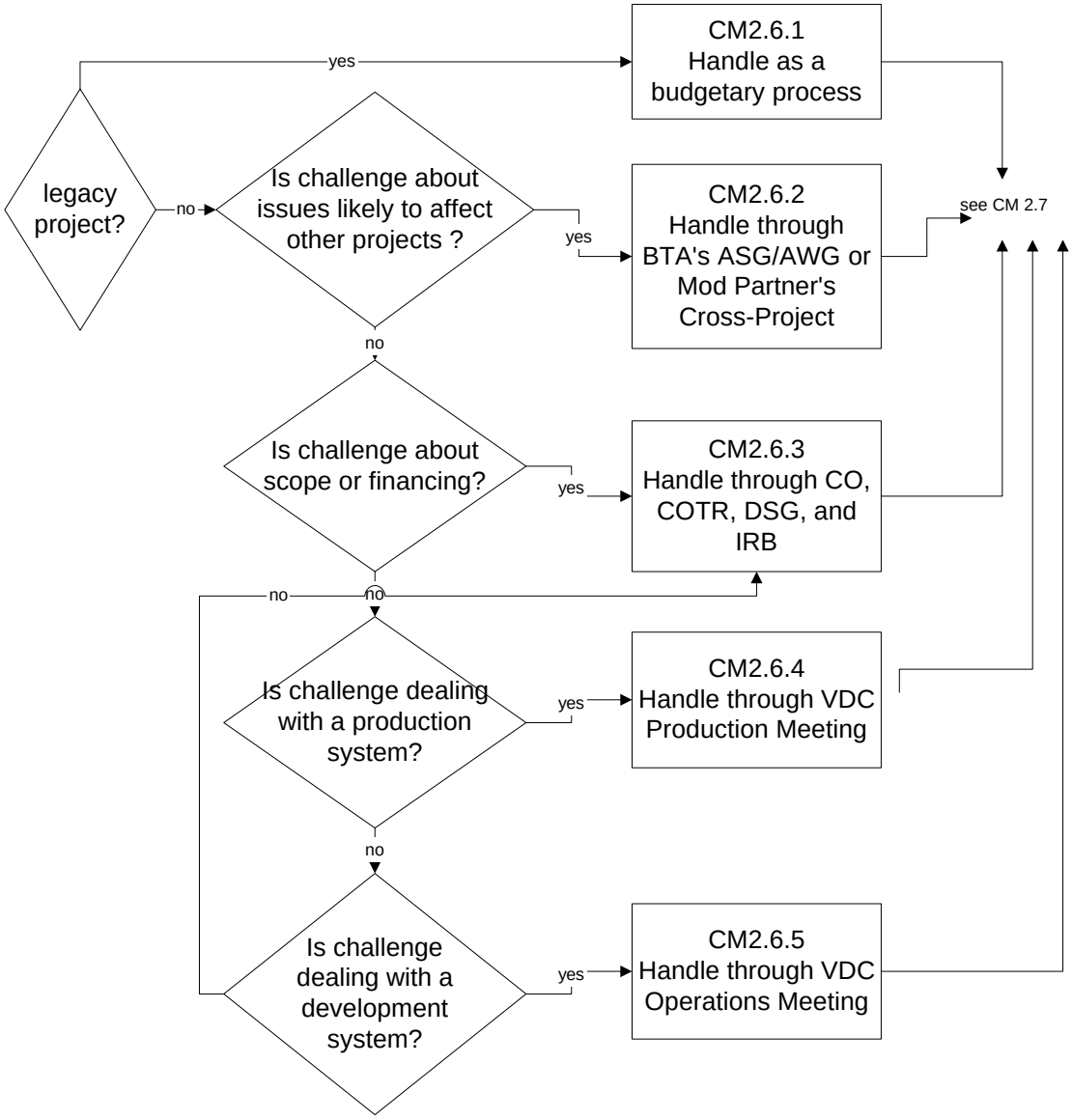
CM2.5.5 – Create new baseline partition(s) for each affected storage space

Whenever a project passes through one of the phases identified in the SLC and CM Process Guides, a new baseline must be created. The old baseline must also continue to exist for GRS24 reasons. In CM2.5.5 the arrangements for additional storage, access rights, if necessary, and the file structure must all be accomplished.

CM2.5.6 – Copy to the new baseline the latest version of all relevant documents

The latest version of all documents that pertain to the new phase must be copied into the new baseline. Notice that the latest version also remains in the old baseline.

2.1.6 Escalation Sub-Procedure (CM2.6.0)



CM2.6.0 Overview

The enterprise level CCG is under development this FY and is in a state of flux. Essentially different conditions send issues for resolution to different bodies.

CM2.6.1 Legacy Projects

There is no formal documented procedure. The de facto procedure is the budgetary process and consultation with the GM, CO, and COTR.

CM2.6.2 Architecture

Issues likely to affect other projects should be elevated through the architecture specialist organizations. There is no formal documented procedure. Issues are raised through ModPartner (using the ModPartner Cross-Project meeting for project architects), through the Architecture Support Group (ASG) (an SFA SME grouping that does not have formal meeting times nor a direct agenda proposing system), or through the Architecture Working Group (AWG) (an SFA business dominated senior grouping that does meet periodically and can direct the ASG to address technical issues.) Common to the Cross-Project, ASG, and AWG groupings is the secretariat function, which in FY02 is managed by the Enterprise Configuration Management Implementation (ECMI) project. The secretariat will champion the agenda process for any project requesting a decision within the architecture frame of reference.

CM2.6.3 Scope and finances

Whenever the project manager perceives that a change is beyond the financial capacity of the present task order or expands the scope beyond the contract, then the project manager must use the GM, CO, and COTR roles for discussion leading to resolution.

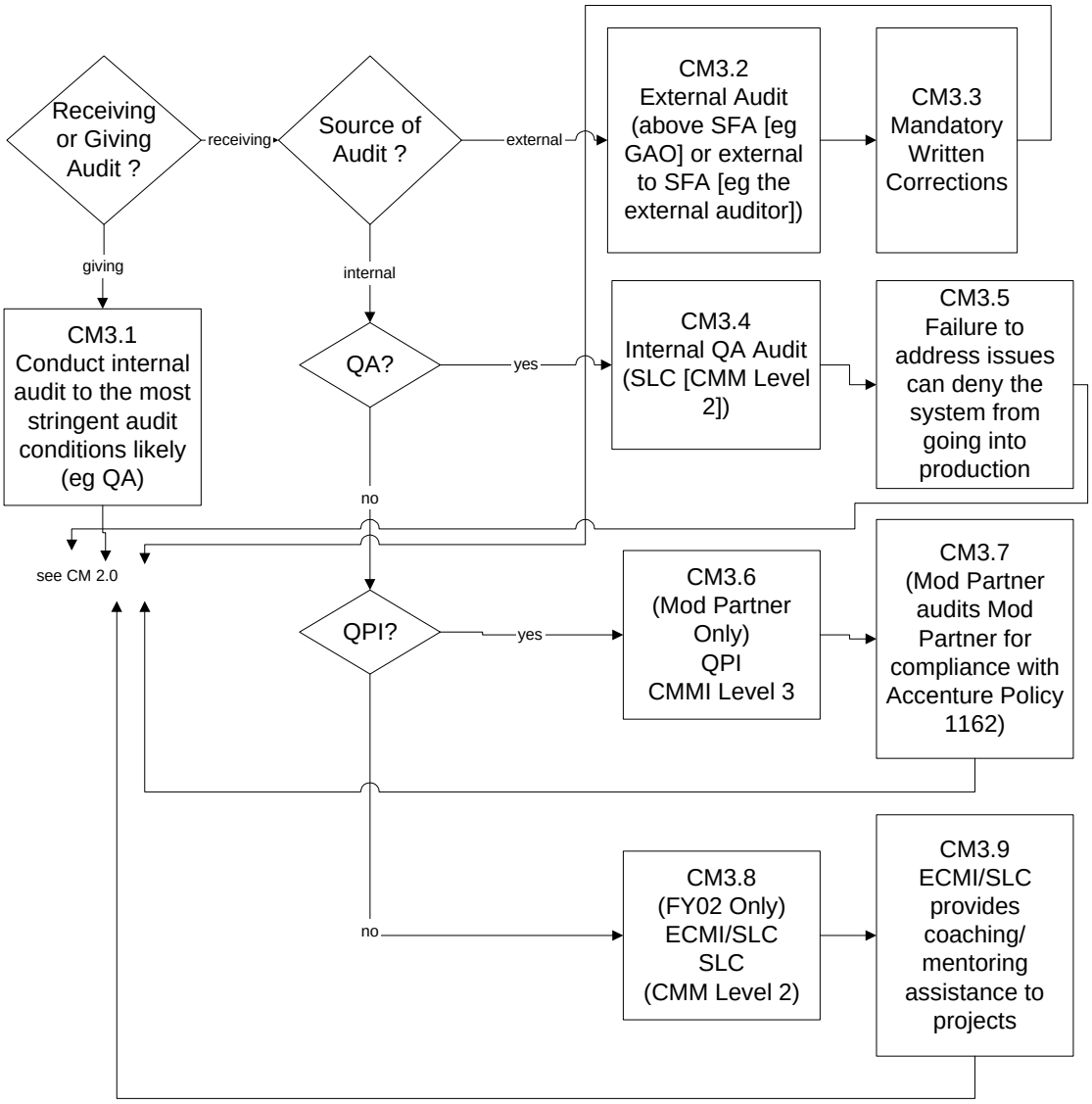
CM2.6.4 VDC Operations Meeting

Issues relating to transitioning from development to production are handled in the VDC Operations Meeting. Current procedures include elevation and resolution of issues. The current procedures are under revision in order to provide better tracking visibility and documentation.

CM2.6.5 VDC Production Meeting

Issues relating to a system already in production are handled in the VDC Production Meeting. Current procedures include elevation and resolution.

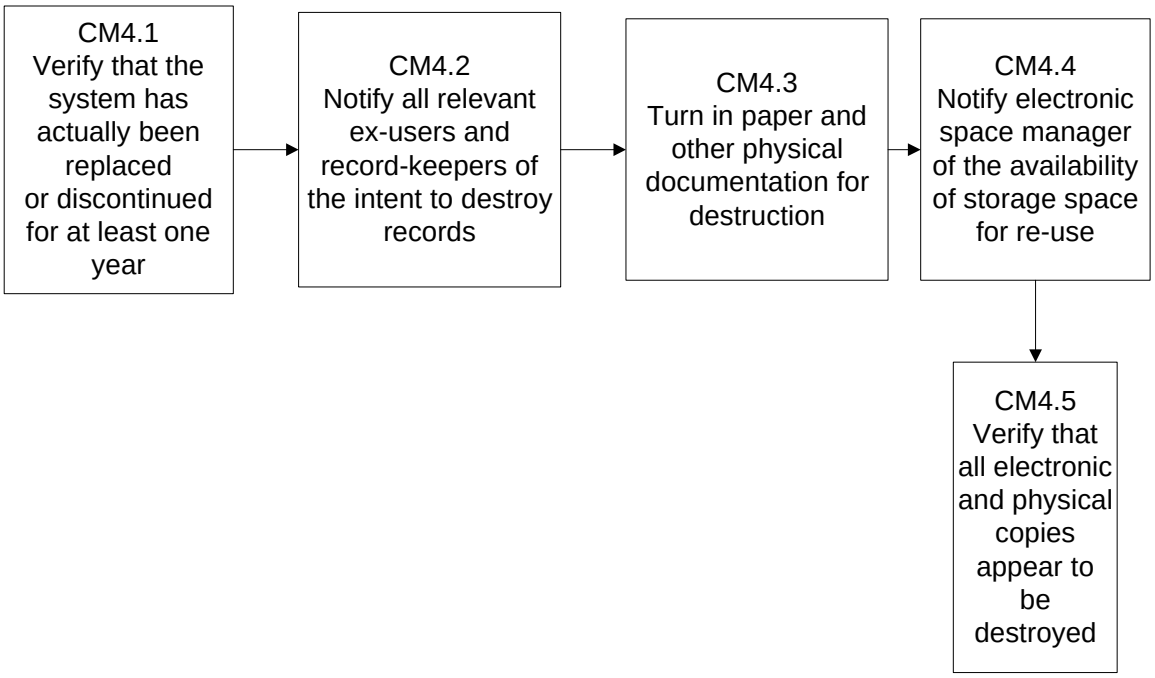
2.1.7 CM Audit Procedure (CM3.0)



CM3.0 Overview

Project Configuration Management includes internal auditing of the project. The project is also subject to external auditing by SFA (CM3.4 and 3.5), by involved contractors according to their own areas of responsibility (e.g. ModPartner for CM3.6 and 3.7), and by any auditing agency with the appropriate authority (e.g. GAO or the financial accounting auditor). Each of these agencies has a different set of goals and the consequences range from simple advice to required written correction documentation.

2.1.8 CM Retirement Procedure (CM4.0)



CM4.0 Overview

Some documentation, such as the latest version of code and its recovery backups, must be maintained. Other documentation (namely the entire decision history of a system) must be stored until one year after the system is replaced or shut down.